Nicholas Marks

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EDUCATION

***Northwestern University*,** Evanston, IL
B.S. Mechanical Engineering – Aerospace Specialization, Minor in Spanish — June 2022
M.S. Mechanical Engineering – Robotics Specialization — June 2023
GPA: 3.29/4.00

TECHNICAL SKILLS

Computer: Python, ROS2, Linux, C, C++, git, Rust, MATLAB, SolidWorks, Siemens NX, LaTeX,
Language: Speaks Spanish, Spanish/English Seal of Biliteracy
Certifications: NAR Level 2 High Power Rocketry Certification

INTERNSHIP EXPERIENCE

Mechanical Engineering Intern – Applied Thin Films Inc. July 2021 – September 2022

- Designed, prototyped, and tested a CNC machine for automating the infiltration process of ceramic matrix composite layups
- Wrote a G-code generator from scratch in Python to produce and simulate rolling patterns for the automated composite layup system
- Programmed/operated a CNC water jet for cutting ceramic matrix composite panels

ROCKETRY TEAM

Chief Engineer – NUSTARS Rocketry Team, Sept 2021 – June 2022

- Oversaw all technical aspects of the project including the design and construction of the launch vehicle, payload, electronics, and recovery systems
- Developed a custom LoRa radio based telemetry system for high-power rockets

Launch Vehicle Team Lead – NUSTARS NASA Student Launch Team, Sept 2020 – May 2021

- Introduced in-house carbon fiber manufacturing for use in constructing rocket airframes, fins, and nose cones with a combination of filament winding, vacuum bagging, and hand-layup techniques
- Led the design and production of the club's first ever 100% in-house built launch vehicle including material selection, flight simulation, manufacturing, and assembly

Independent Study: Reaction wheel for rocket roll control, Fall 2020

- Designed, built, and tested a reaction wheel for autonomously controlling a rocket about its roll axis

RESEARCH EXPERIENCE

X-Ray Optics Researcher - Northwestern University CIERA, Prof. Melville Ulmer's Group (Summer 2019-20)

- Developing adaptive optics technology for use in creating deformable X-ray telescope mirrors using Terfenol-D, a shape memory alloy
- Integrated a custom computer-controlled relay with MATLAB control software to switch between AC and DC power supplies remotely

Publications

Melville P. Ulmer, Mohammadreza Jalilvand, **Nicholas A. Marks** et al., "The prospects for applying magnetic smart materials combined with shape memory alloys to produce correctable and deployable space telescopes"; https://doi.org/10.1117/12.2564726